

**DIRECT INJECTION OF NATURAL GAS:
IN-CYLINDER MEASUREMENTS AND CALCULATIONS**

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DOE/NASA Grant NAG 3-1552

Abstract

We discuss a collaborative effort among the University of Illinois at Urbana/Champaign, the University of Michigan, and Caterpillar Engine Research to investigate mixing and combustion in a direct-injection natural gas engine. A Caterpillar DING engine has been modified to provide optical access for advanced laser diagnostic measurements of in-cylinder processes. Laser measurements to be performed at the University of Illinois include coherent anti-Stokes Raman scattering (CARS) measurements of temperature and fuel/air ratio and planar laser-induced fluorescence (PLIF) measurements of fuel/air mixing and flame structure. At the University of Michigan, a model of the mixing and combustion processes in the cylinder is being developed based on a modified version of the Los Alamos KIVA-3 code.